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EXAMINER	
TOY, ALEX B	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/743,095	Applicant(s) GOBLE, COLIN C.O.	
	Examiner Alex B. Toy	Art Unit 3739	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) *10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/30/04; 5/28/04*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-55 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of copending Application No. 11/032141. Although the conflicting claims are not identical, they are not patentably distinct from each other because the protection circuitry of 10/743095 serves the same function as the control circuit of 11/032141 to regulate the delivered RF power in response to various electrical parameters. In addition, both applications contain means for sensing said electrical parameters. Claim 14 of 11/032141 is merely a broader recitation of limitations in 10/743095.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Objections

Claim 10 is objected to because of the following informalities: Claim 10 depends only from claims 1 and 7 and, therefore, lacks antecedent basis for "the predetermined level." For the purposes of examination, it is assumed that applicant intended claim 10 to depend from claims 1, 7, and 8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 55 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 55 specifies "a system according to any of claim 20," which is indefinite and unclear. For the purposes of examination, it is assumed that claim 55 simply depends from claim 20.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 16-18, 26, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malis et al. (U.S. Pat. No. 4,590,934) in view of Goble (U.S. Pat. No. 6,093,186).

Regarding claim 1, Malis et al. ('934) disclose an electrosurgical generator for supplying radio frequency (RF) power to an electrosurgical instrument for cutting or vaporizing tissue, wherein the generator comprises an RF output stage having:

at least one RF power device 34 (Fig. 2),

at least one pair of output lines for delivering RF power to the instrument (Figs. 2-3), and

wherein the output impedance of the output stage at the output lines is less than 200/sqrt P ohms, where P is the maximum continuous RF output power of the generator in watts.

On page 4 of the specification, applicant discloses that it is preferable to use a maximum power of 400 W for wet field surgery and 16 W for dry field surgery. This

translates to an output impedance that is less than 10 ohms for wet field surgery and less than 50 ohms for dry field surgery. In accordance with claim 1, Malis et al. disclose an output impedance of approximately 5-10 ohms for wet field or dry field surgery (col. 2, ln. 7-13). In addition, applicant has not disclosed any criticality or unexpected result that is associated with using the formula of 200/sqrt P.

The claim differs from Malis et al. ('934) in calling for the generator to comprise a series-resonant output network coupled between the RF power device and the said pair of output lines. Goble, however, teaches an electrosurgical generator comprising a series-resonant output network coupled between the RF power device and the said pair of output lines to allow an instantaneous power reduction in response to a voltage threshold detection (col. 11, ln. 44-47, col. 9, ln. 25-28, and Fig. 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a series-resonant output network in the generator of Malis et al. in view of the teaching of Goble to allow an instantaneous power reduction in response to a voltage threshold detection.

Regarding claim 2, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble. In addition, Malis et al. disclose a generator comprising protection circuitry responsive to a predetermined electrical condition indicative of an output current overload substantially to interrupt the RF power supplied to the output network (col. 23, ln. 14-40 and Fig. 2).

Regarding claim 16, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble. In addition, Malis et al. disclose a generator for supplying radio

frequency (RF) power to an electrosurgical instrument for cutting or vaporizing tissue in wet field electrosurgery, and wherein the output impedance of the output stage at the output lines is less than 10 ohms (col. 2, ln. 7-13).

Regarding claim 17, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble. In addition, Malis et al. disclose a generator for supplying radio frequency (RF) power to an electrosurgical instrument for cutting or vaporizing tissue in dry field electrosurgery, and wherein the output impedance of the output stage at the output lines is less than 50 ohms (col. 2, ln. 7-13).

Regarding claim 18, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble. In addition, Malis et al. disclose a generator, wherein the output impedance is less than 100/sqrt P ohms. On page 4 of the specification, applicant discloses that it is preferable to use a maximum power of 400 W for wet field surgery and 16 W for dry field surgery. This translates to an output impedance that is less than 5 ohms for wet field surgery and less than 25 ohms for dry field surgery. Malis et al. disclose an output impedance of approximately 5-10 ohms for wet field or dry field surgery (col. 2, ln. 7-13). Since this is an approximate value, it includes values slightly below 5 ohms, which is in accordance with claim 18. In addition, applicant has not disclosed any criticality or unexpected result that is associated with using the formula of 100/sqrt P.

Regarding claim 26, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble. In addition, Malis et al. ('934) disclose a generator, wherein the RMS RF output voltage is substantially constant within a load impedance range of from

600/sqrt P ohms to 1000 ohms. On page 4 of the specification, applicant discloses that it is preferable to use a maximum power of 400 W for wet field surgery and 16 W for dry field surgery. This translates to load impedance ranges of 30-1000 ohms for wet field surgery and 150-1000 ohms for dry field surgery. In accordance with claim 26, Malis et al. ('934) disclose a generator, wherein the RMS RF output voltage is substantially constant within a load impedance range of 0-5000 ohms under wet or dry conditions (col. 5, ln. 26-35 and col. 2, ln. 7-11).

Regarding claim 29, see the rejections of claims 1 and 26. In addition, Malis ('934) discloses a generator wherein the generator is configured to be capable of maintaining a peak output voltage of at least 300 V (col. 22, ln. 41-54).

Regarding claim 30, see the rejection of claim 1.

Regarding claim 31, see the rejection of claim 1.

Claims 3-7, 11-15, 19-21, 24-25, 27-28, 32-38, 41-46, and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malis et al. ('934) in view of Goble ('186) and further in view of Malis et al. (U.S. Pat. No. 5,318,563).

Regarding claim 3, Malis et al. ('934) disclose the generator according to claims 1 and 2 in view of Goble ('186). The claim differs from Malis et al. ('934) in view of Goble ('186) in calling for the protection circuitry to be responsive to application of a short circuit across the output lines, and wherein the series-resonant output network is such that the rate of rise of the output current at the output lines when the short is applied is less than (sqrt P)/4 amps per microsecond. Malis et al. ('563), however, teach

an electrosurgical generator with protection circuitry 328, 341 that is responsive to application of a short circuit across the output lines to prevent excessively high RF current from destroying the RF power amplifier and the bipolar instrument (col. 20, ln. 49 – col. 21, ln. 19 and Figs. 11 and 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the protection circuitry of Malis ('934) to be responsive to application of a short circuit across the output lines in view of the teaching of Malis ('563) to prevent excessively high RF current from destroying the RF power amplifier and the bipolar instrument. Furthermore, since applicant has not disclosed any criticality or unexpected result for the particular value of (sqrt P)/4 amps per microsecond, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have configured the series-resonant output network of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) to have this value.

Regarding claim 4, Malis et al. ('934) disclose the generator according to claims 1 and 2 in view of Goble ('186). The claim differs from Malis et al. ('934) in calling for the protection circuitry to be responsive to application of a short circuit across the output lines, and wherein the protection circuitry is responsive to the said short circuit sufficiently quickly to disable the RF power device before the current passing therethrough rises to a rated maximum current as a result of the short circuit. Malis et al. ('563), however, teach an electrosurgical generator with protection circuitry 328, 341 that is responsive to application of a short circuit across the output lines, and wherein the protection circuitry is responsive to the said short circuit sufficiently quickly to

disable the RF power device before the current passing therethrough rises to a rated maximum current as a result of the short circuit to prevent excessively high RF current from destroying the RF power amplifier and the bipolar instrument (col. 20, ln. 49 – col. 21, ln. 19 and Figs. 11 and 16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the protection circuitry of Malis ('934) to be responsive to application of a short circuit across the output lines, and wherein the protection circuitry is responsive to the said short circuit sufficiently quickly to disable the RF power device before the current passing therethrough rises to a rated maximum current as a result of the short circuit in view of the teaching of Malis ('563) to prevent excessively high RF current from destroying the RF power amplifier and the bipolar instrument.

Regarding claims 5 and 19-21, Malis et al. ('934) disclose the generator according to claims 1 and 2 in view of Goble ('186). Malis et al. ('934) further disclose the generator according to claim 4 in view of Goble ('186) and further in view of Malis et al. ('563), wherein the power device is disabled in response to the application of the short circuit to the output lines (col. 20, ln. 49 – col. 21, ln. 19 and Figs. 11 and 16). The claim differs from Malis et al. ('934) in calling for the disabling to occur in a time period corresponding to less than 3 (claims 5 and 20), 20 (claim 19), or 1 (claim 21) RF cycles of the delivered RF power. Malis et al. ('563), however, teach disabling the power device within at most 100 milliseconds to prevent excessively high RF current from destroying the RF power amplifier and the bipolar instrument (col. 20, ln. 49 – col. 21,

ln. 19 and Figs. 11 and 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the protection circuitry of Malis et al. ('934) able to disable the power device within at most 100 milliseconds in view of the teaching of Malis et al. ('563) to prevent excessively high RF current from destroying the RF power amplifier and the bipolar instrument

Applicant has disclosed no other criticality for the time period corresponding to less than 1, 3, or 20 RF cycles other than to prevent a short circuit across the power device and excessively high RF current. The generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) is capable of preventing a short circuit across the power device and excessively high RF current in response to a short circuit across the output lines. Therefore, the generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) is in accordance with claims 5 and 19-21.

Regarding claim 6, Malis et al. ('934) disclose the generator according to claims 1 and 2 in view of Goble ('186). The claim differs from Malis et al. ('934) in calling for the predetermined electrical condition to be indicative of an instantaneous current in the output stage exceeding a predetermined level, and wherein the speed of response of the protection circuitry is such that the said condition is detected within the RF cycle during which the instantaneous current exceeds the said level. Malis et al. ('563), however, teach a generator wherein the predetermined electrical condition is indicative of an instantaneous current in the output stage exceeding a predetermined level, and wherein the speed of response of the protection circuitry is such that the said condition

is detected within the RF cycle during which the instantaneous current exceeds the said level in order to prevent an overshoot condition (col. 12, ln. 35-61 and Fig. 9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the predetermined electrical condition of Malis et al. ('934) indicative of an instantaneous current in the output stage exceeding a predetermined level, and wherein the speed of response of the protection circuitry is such that the said condition is detected within the RF cycle during which the instantaneous current exceeds the said level in view of the teaching of Malis et al. ('563) in order to prevent an overshoot condition.

Regarding claim 7, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble ('186). The claim differs from Malis et al. ('934) in calling for:

a power supply stage coupled to the RF output stage, the power supply including a charge-storing element for supplying power to the power device or devices and a voltage-sensing circuit arranged to sense the voltage supplied to the RF output stage by the charge-storing element; and

a pulsing circuit coupled to the voltage sensing circuit for pulsing the or each power device, the arrangement of the voltage sensing and pulsing circuits being such that the timing of the pulses is controlled in response to the sensed voltage.

Malis et al. ('563), however, teach a generator including:

a power supply stage coupled to the RF output stage, the power supply including a charge-storing element for supplying power to the power device or devices and a

voltage-sensing circuit arranged to sense the voltage supplied to the RF output stage by the charge-storing element; and

a pulsing circuit coupled to the voltage sensing circuit for pulsing the or each power device, the arrangement of the voltage sensing and pulsing circuits being such that the timing of the pulses is controlled in response to the sensed voltage in order to prevent the charge-storing element from reaching saturation (col. 17, ln. 48-61 and Fig. 9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the generator of Malis et al. ('934) in accordance with claim 7 in view of the teaching of Malis et al. ('563) in order to prevent a charge-storing element from reaching saturation.

Claims 11-15 recite limitations without any criticality or unexpected result other than the fact that they are parameters under which it is possible to use the generator to start arcing under conditions of relatively low load impedance. The generator of Malis et al. ('934), however, is designed to start arcing under conditions of relatively low load impedance (col. 2, ln. 7-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have operated the generator of Malis et al. ('934) using the parameters recited in claims 11-15 as matter of routine skill in the art to achieve the same function of start arcing under conditions of relatively low load impedance.

Further regarding claim 15, Malis et al. ('934) disclose a generator that is capable of first outputting a pulsed RF signal and then, in a subsequent period, a constant power RF signal (col. 21, ln. 63 – col. 22, ln. 15).

Regarding claim 24, Malis et al. ('934) disclose the generator according to claim 1 in view of Goble ('186). In addition, Malis et al. ('934)/Goble ('186)/Malis et al. ('563) disclose the generator according to claims 1-3 with the protection circuitry responsive to application of a short circuit (see rejection of claim 3). The generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) further comprises protection circuitry which has a current sensing circuit 151 including a pick-up arrangement 180 coupled in series between the power device and the series-resonant output network, a comparator 150, 161 having a first input coupled to the pick-up arrangement and a second input coupled to a reference level source, and disabling circuitry 162 coupled to an output of the comparator to disable the power device when the comparator output changes state in response to the instantaneous current sensed by the pick-up arrangement exceeding the predetermined level as set by the reference level source (Malis ('563) col. 12, ln. 35-56).

Regarding claim 25, Malis et al. ('934)/Goble ('186)/Malis et al. ('563) disclose the generator according to claims 1-3 (see rejection of claim 3). The generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) further comprises protection circuitry which includes a monostable stage and is operable, in response to detection of the said predetermined condition, to disable the power device for a limited period determined by a time constant of the monostable stage, the time constant corresponding to less than

20 cycles of the operating frequency of the generator (col. 20, ln. 49 – col. 21, ln. 13). Again, applicant has disclosed no other criticality for the time period corresponding to less 20 cycles other than to prevent a short circuit across the power device and excessively high RF current. The generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) is capable of preventing a short circuit across the power device and excessively high RF current in response to a short circuit across the output lines. Therefore, the generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) is in accordance with claim 25.

Regarding claim 27, see the rejections of claims 1-4.

Regarding claim 28, see the rejections of claims 5 and 27.

Regarding claims 32-34, see the rejections of claims 1, 7, 26, and 29. In addition, applicant has not disclosed any criticality or unexpected result regarding the crest factor limitations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the crest factor of the generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) in accordance with claims 32-34 as a matter of routine skill in the art.

Regarding claims 35-38, see the rejections of claims 1, 7, and 11-15. Further regarding claim 35, Malis ('934) discloses a DC isolation capacitance between the source and the active output terminal (col. 2, ln. 34-38).

Regarding claim 41, see the rejections of claims 1, 7, 11, 15, and 35.

Regarding claim 42, see the rejections of claims 1, 7, 11-15, and 35.

Regarding claim 43, see the rejection of claim 41. In addition, it is inherently possible to cause said subsequent period to begin at a predetermined time interval after the beginning of said initial period – i.e. the user can change from the coag mode (pulsed RF power) to the cut mode (constant RF power) at a predetermined time interval.

Regarding claim 44, see the rejection of claim 41. In addition, Malis ('934) includes means for monitoring in use of the generator, the load impedance between the return output terminal and the active output terminal (col. 2, ln. 34-38), the generator being arranged to begin said subsequent period when the magnitude of output impedance increases by a factor of 10. Since the generator of Malis ('934) is hooked up to a microprocessor, it is inherently capable of being arranged in accordance with claim 44.

Regarding claim 45, see the rejection of claim 41. In addition, since the generator of Malis ('934) is hooked up to a microprocessor, it is inherently capable of being arranged such that said subsequent period is begun in response to the supply voltage as sensed by the voltage-sensing circuit reaching a predetermined voltage threshold.

Regarding claim 46, see the rejection of claim 45. In addition, applicant has not disclosed any criticality or unexpected result associated with having the charge-storing element comprise a capacitance of at least 1000 μF. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a 1000 μF capacitor as the charge-storing element of Malis ('934) as a matter of routine

skill in the art. Since the generator of Malis ('934) is hooked up to a microprocessor, it is inherently capable of having the timing of at least the beginnings of the pulses produced by the output stage during the initial period being determined in response to said supply voltage reaching the said voltage threshold.

Regarding claim 51, see the rejections of claims 1, 7, and 11. In addition, Malis ('934) discloses a generator with a bipolar electrosurgical instrument having an electrode assembly with at least a pair of electrodes (col. 1, ln. 57-59).

Regarding claim 52, see the rejections of claims 15 and 51.

Regarding claim 53, see the rejections of claims 42 and 51.

Regarding claim 54, see the rejection of claim 37. In addition, Malis ('934) discloses a generator with a bipolar electrosurgical instrument having at least an active electrode coupled to the said active output terminal and a return electrode coupled to the said return output terminal (col. 1, ln. 57-62).

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malis et al. ('934)/Goble ('186)/Malis et al. ('563) and further in view of Harano et al. (U.S. PGPub 2002/0165530 A1).

Regarding claim 8, Malis et al. ('934)/Goble ('186)/Malis et al. ('563) disclose a generator according to claim 7. The claim differs from Malis et al. ('934)/Goble ('186)/Malis et al. ('563) in calling for the voltage sensing circuit and the pulsing circuit to be arranged to terminate individual pulses of RF energy delivered by the RF power

device or devices when the sensed voltage falls below a predetermined level. Harano et al. ('530), however, teach an electrosurgical generator wherein the voltage sensing circuit is arranged to terminate RF energy delivered by the RF power device or devices when the sensed voltage falls below a predetermined level to prevent operation when there is a short circuit (pg. 4, ¶ 67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have arranged the voltage sensing circuit and the pulsing circuit in the generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) to terminate individual pulses of RF energy delivered by the RF power device or devices when the sensed voltage falls below a predetermined level in view of the teaching of Harano et al. ('530) as an obvious alternate way of preventing operation when there is a short circuit.

Regarding claim 9, Malis et al. ('934)/Goble ('186)/Malis et al. ('563)/Harano et al. ('530) disclose a generator according to claims 1, 7, and 8, wherein the predetermined level is set such that the pulse termination occurs when the voltage falls to or lower than a predetermined level. The claim differs from Malis et al. ('934)/Goble ('186)/Malis et al. ('563)/Harano et al. ('530) in calling for the predetermined level to be when the voltage falls by a predetermined percentage value of between 5 percent and 20 percent. Applicant, however, has not disclosed any criticality or unexpected result associated with this value. Therefore, it would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to have made the predetermined level of Harano et al. ('530) to be when the voltage falls by a predetermined percentage value of between 5 percent and 20 percent. One of ordinary

skill in the art, furthermore, would have expected applicant's invention to perform equally well with either a predetermined level of Harano et al. ('530) or the claimed percentage value because both values perform the same function of preventing decay of the supply voltage.

Regarding claim 10, Malis et al. ('934)/Goble ('186)/Malis et al. ('563)/Harano et al. ('530) disclose a generator according to claims 1, 7, and 8, wherein the predetermined level is set such that the pulse termination occurs when the voltage falls to or lower than a predetermined level. The claim differs from Malis et al. ('934)/Goble ('186)/Malis et al. ('563)/Harano et al. ('530) in calling for the predetermined level to be when the peak RF voltage delivered at the output lines has fallen to a value of between 25V and 100V below its starting value for the respective pulse. Applicant, however, has not disclosed any criticality or unexpected result associated with this value. Therefore, it would have been an obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to have made the predetermined level of Harano et al. ('530) to be when the peak RF voltage delivered at the output lines has fallen to a value of between 25V and 100V below its starting value for the respective pulse. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with either a predetermined level of Harano et al. ('530) or the claimed value because both values perform the same function of preventing decay of the supply voltage.

Claims 1, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malis ('934) in view of Feucht (U.S. Pat. No. 5,067,953).

Regarding claim 1, Malis et al. ('934) disclose an electrosurgical generator for supplying radio frequency (RF) power to an electrosurgical instrument for cutting or vaporizing tissue, wherein the generator comprises an RF output stage having:

at least one RF power device 34 (Fig. 2),

at least one pair of output lines for delivering RF power to the instrument (Figs. 2-3), and

wherein the output impedance of the output stage at the output lines is less than 200/sqrt P ohms, where P is the maximum continuous RF output power of the generator in watts.

On page 4 of the specification, applicant discloses that it is preferable to use a maximum power of 400 W for wet field surgery and 16 W for dry field surgery. This translates to an output impedance that is less than 10 ohms for wet field surgery and less than 50 ohms for dry field surgery. In accordance with claim 1, Malis et al. disclose an output impedance of approximately 5-10 ohms for wet field or dry field surgery (col. 2, ln. 7-13). In addition, applicant has not disclosed any criticality or unexpected result that is associated with using the formula of 200/sqrt P.

The claim differs from Malis et al. ('934) in calling for the generator to comprise a series-resonant output network coupled between the RF power device and the said pair of output lines. Feucht ('953), however, teaches an electrosurgical generator comprising a series-resonant output network 50-53 coupled between the RF power device and the

said pair of output lines to act as a filter to block excessively high frequencies (col. 6, ln. 63 – col. 7, ln. 1 and Figs. 1 and 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a series-resonant output network in the generator of Malis ('934) in view of the teaching of Feucht ('953) to act as a filter to block excessively high frequencies.

Regarding claim 22, Malis ('934) discloses the generator according to claim 1 in view of Feucht ('953). In addition, the series-resonant output network of Feucht ('953) is tuned to the operating frequency (col. 6, ln. 65-68).

Regarding claim 23, Malis ('934) discloses the generator according to claims 1 and 22 in view of Feucht ('953). In addition, applicant has not disclosed any criticality or unexpected result associated with a substantially constant operating frequency. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have operated the generator of Malis et al. ('934) in view of Feucht ('953) at a substantially constant operating frequency as matter of routine skill in the art.

Claims 39 and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malis et al. ('934)/Goble ('186)/Malis et al. ('563) and further in view of Goble (U.S. Pat. No. 6,228,081 B1).

Regarding claim 39, Malis et al. ('934)/Goble ('186)/Malis et al. ('563) disclose the generator according to claim 35 operable with a 20 ohm load and having a resonant output network. The claim differs in calling for the generator to be able to generate a

peak power of at least 1 kW. Goble ('081), however, teaches an electrosurgical generator, wherein the generator is able to generate a peak power of at least 1 kW in order to permit rapid tissue removal (col. 3, ln. 45-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have operated the generator of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) at at least 1 kW in view of the teaching of Goble ('081) in order to permit rapid tissue removal.

Regarding claim 47, Malis et al. ('934)/Goble ('186)/Malis et al. ('563) disclose the generator according to claim 35 including a resonant output network. In addition, applicant has not disclosed any criticality for the generator power versus lead impedance load curve having a peak at a load impedance of less than 50 ohms other than providing high power at low impedance without voltage overshoot. Malis et al. ('934)/Goble ('186)/Malis et al. ('563)/Goble ('081), however, disclose a generator capable of providing high power at low impedance without voltage overshoot.

Regarding claim 48, see the rejection of claim 47. In addition, Goble ('186) discloses an output network that is a series-resonant network comprising an in-line inductance, the output of the network being taken across a capacitance which resonates with the inductance (Fig. 5).

Regarding claim 49, see the rejection of claim 47. In addition, applicant has not disclosed any criticality or unexpected result associated with having said output network provide a source impedance in the range of from 50 ohms to 500 ohms at the output terminals. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have said output network provide a source impedance

in the range of from 50 ohms to 500 ohms at the output terminals as a matter of routine skill in the art.

Regarding claim 50, see the rejection of claim 47. In addition, Malis ('934) discloses a generator, wherein the RF source includes a variable frequency RF oscillator, the RF output frequency of which is limited to a maximum value below that of the resonant output network in its matched load condition (col. 2, ln. 31-38).

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Malis et al. ('934)/Goble ('186)/Malis et al. ('563) and further in view of Eggers (U.S. Pat. No. 5,693,045).

Regarding claim 40, Malis et al. ('934)/Goble ('186)/Malis et al. ('563) disclose the generator according to claim 35. The claim differs in calling for an output voltage limiting means limiting the peak output voltage to between 900 V and 1100 V peak-to-peak. Eggers, however, teaches a cable adaptor for use with electrosurgical generators such as Malis ('934), wherein the adaptor limits the peak output voltage to a preselected value in order to reduce coagulum buildup, arcing, and tissue sticking to the instrument (col. 3, ln. 1-6 and col. 3, ln. 35-40). Although Eggers does not specifically cite the range between 900 V and 1100 V peak-to-peak, he discloses that a preselected value may be chosen and the invention adapted to meet this value (col. 5, ln. 3-12). Thus, it would require only routine experimentation and skill in the art to choose the claimed range. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the generator of Malis et al. ('934)/Goble ('186)/Malis

et al. ('563) with an adaptor cable to limit output voltage further in view of the teaching of Eggers in order to reduce coagulum buildup, arcing, and tissue sticking to the instrument.

Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Malis et al. ('934)/Goble ('186)/Malis et al. ('563) and further in view of Muri (U.S. Pat. No. 5,776,215).

Regarding claim 55, see the rejection of claim 20. The claim differs from Malis et al. ('934)/Goble ('186)/Malis et al. ('563) in calling for the active electrode to be formed as a conductive loop. Muri, however, teaches forming the active electrode as a conductive loop (Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the active electrode of Malis et al. ('934)/Goble ('186)/Malis et al. ('563) as a conductive loop in view of the teaching of Muri as an obvious alternate electrode shape that is well-known in the art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 4092986 A	USPAT	Schneiderman; Max
US 4117846 A	USPAT	Williams; Frank R.
US 5134356 A	USPAT	El-Sharkawi; Mohamed A. et al.
US 5496313 A	USPAT	Gentelia; John S. et al.
US 5628771 A	USPAT	Mizukawa; Satoshi et al.
US 5766153 A	USPAT	Eggers; Philip E. et al.
US 5836943 A	USPAT	Miller, III; Scott A.
US 6074386 A	USPAT	Goble; Nigel Mark et al.

US 6106524 A	USPAT	Eggers; Philip E. et al.
US 6132426 A	USPAT	Kroll; Mark W.
US 6228080 B1	USPAT	Gines; David Lee
US 20020097042 A1	US-PGPUB	Kawate, Keith W. et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex B. Toy whose telephone number is (571) 272-1953. The examiner can normally be reached on Monday through Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda C.M. Dvorak can be reached on (571) 272-4764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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